

Relative Size Practice Set 1

Scoring Form

Project: NAEP

Grade: 8

Subject: Science

Item: F2S11_06 Relationship size of particles and rate of water

Scorer Name: _____

ID#: _____

Date: _____

P1	<i>Reader Score</i>	<i>Actual Score</i>
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
		%

P2	<i>Reader Score</i>	<i>Actual Score</i>
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
		%

Relative Size Practice Set 1

Contents

Item: Relationship size of particles and rate of water.....p.1.....	3
Item: Relationship size of particles and rate of water.....p.2.....	4
Anchor Set.....p.1.....	5
Anchor Setp.2.....	6
Anchor Set 3.....p.1.....	7
Anchor Set 2Ap.2.....	8
Anchor Set 2B.....p.3.....	9
Anchor Set 1.....p.4.....	10
Practice Set 1 Score Guide.....p.1.....	11
Practice Set 1 Score Guide Continued.....p.2.....	12
Practice Set 1 Repsonses.....p.1.....	13
Practice Set 1 Repsonses.....p.2.....	14
Practice Set 1 Repsonsesp.3.....	15
Practice Set 1 Repsonsesp.4.....	16
Practice Set 1 Repsonsesp.5.....	17

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NAEP: The One Stop Shop for Teachers

2:00 PM-3:50 PM

MS 204

Teachers will gain hands-on experience with released items specifically learning how to: create assessments, score items, and map items. Lastly, teachers will learn how NAEP science frameworks can be paralleled to NGSS and learn how MT students performed on released items.

Relative Size Practice Set 1

Item: Relationship size of particles and rate of water.....p.1

Questions 6–8 refer to the following information.

Most soils are a mixture of particles of different sizes. Water moves through soil at different rates, depending largely on how much of each size particle makes up the soil. The table below shows the percentage of each size particle in five different soils (A, B, C, D, E) and the rate at which water moves through each of the soils.

RATE OF WATER MOVING THROUGH DIFFERENT SOILS

Soil	Percentage Largest Particles (%)	Percentage Medium-Sized Particles (%)	Percentage Smallest Particles (%)	Rate of Water Draining Through Soil (cm/hr)
A	100	0	0	21
B	85	10	5	6.1
C	40	40	20	1.3
D	20	65	15	0.69
E	0	0	100	0.05

VC298869

6. Describe the relationship between the size of the soil particles and the rate at which water moves through the soil. Use the data in the table to support your answer.

VC298870

7. Explain why the size of the soil particles affects the rate at which water moves through the soil.

Relative Size Practice Set 1

Item: Relationship size of particles and rate of water.....p.2

Questions XX–XX refer to the following information.

Most soils are a mixture of particles of different sizes. Water moves through soil at different rates, depending largely on how much of each size particle makes up the soil. The table below shows the percentage of each size particle in five different soils (A, B, C, D, E) and the rate at which water moves through each of the soils.

RATE OF WATER MOVING THROUGH DIFFERENT SOIL TEXTURES

Soil	Percentage Largest Particles (%)	Percentage Medium-Sized Particles (%)	Percentage Smallest Particles (%)	Rate of Water Draining Through Soil (cm/hr)
A	100			21
B	85	10	5	6.1
C	40	40	20	1.3
D	20	65	15	0.69
E			100	0.05

Content Area	Earth and Space Science		
Content Topic - Subtopic	Earth Structures - Properties of Earth Materials		
Content Statement	E8.6: Soil consists of weathered rocks and decomposed organic material from dead plants, animals, and bacteria. Soils are often found in layers with each having a different chemical composition and texture.		
Science Practice	Using Scientific Inquiry		
Cognitive Demand	Knowing How		
Achievement Level			

Item:

VC298869

Describe the relationship between the size of the soil particles and the rate at which water moves through the soil. Use the data in the table to support your answer.

Relative Size Practice Set 1

Anchor Set.....p.1

Paper	Ref #	Score	Notes
A-1	(256337)	3	Response correctly describes the relationship between size of soil particles to rate of water passing through the soil and includes supporting data from the table: . . . <i>more large particles, water will drain more quickly. . . Soil A has 100% larger . . . water moves at 21 cm/hr . . . Soil E, which has 100% smaller particles . . . moves at 0.05 cm/hr.</i>
A-2	(256401)	3	Response correctly describes the relationship between size of soil particles to rate of water passing through the soil and includes supporting data from the table: <i>The larger the particles in the soil, the faster the water moves through. Soil A had 100% large particles and the water moved faster through Soil A.</i>
A-3	(256311)	3	Response correctly describes the relationship between size of soil particles to rate of water passing through the soil and includes supporting data from the table: <i>moves slower through little particles (E) moves faster through big particles (A).</i>
A-4	(256476)	2A	Response correctly describes the relationship between size of soil particles to rate of water passing through the soil but does not include supporting data: <i>The larger the partioles the faster water moves the smaller the particles the slower water moves.</i>
A-5	(256375)	2A	Response correctly describes the relationship between size of soil particles to rate of water passing through the soil but does not include supporting data: . . . <i>smaller the particles sizes . . .the slower water will move.</i>
A-6	(256485)	2A	Response correctly describes the relationship between size of soil particles to rate of water passing through the soil but does not include supporting data: <i>The larger the soil particles, the faster water moves through the soil.</i>

Relative Size Practice Set 1

Anchor Setp.2

Paper	Ref #	Score	Notes
A-7	(256432)	2B	Response provides a correct statement using data in the table, but does not describe the relationship between size of soil particles and rate of water: . . . <i>soil A 100% of the largest particles it moves through the water at a rate of 21 cm. per hour . . . soil E 100% of the smallest particles it drains through the water at 0.05 cm. per hour.</i> The listing of two soil types <u>only</u> is an implied comparison of the water rates. Also, the data is chosen to address the size/rate relationship.
A-8	(256332)	2B	Response provides a correct statement using data in the table, but does not describe the relationship between size of soil particles and rate of water: <i>In soil A the rate of water more than soil E.</i>
A-9	(000018)	1	Response provided is incorrect: . . . <i>bigger the soil particle . . . slower it moves. . . smaller it is, the quicker it moves.</i> Water would move quicker with bigger particles and slower with smaller particles.
A-10	(256333)	1	Response provided is incorrect: . . . <i>smaller amount of particles the faster rate, and the largest amount of particles the slower the rate.</i> Amount of particles is not the same as size of particles.
A-11	(256426)	1	Response provided is inadequate: <i>In A the water runs 21cm/hr. In B it runs 6.1 cm/hr. . . In e it runs 0.05 cm/hr.</i> This is a restating of the last column of the table provided for this item. It does not describe or imply any understanding of size of particles and/or rate of water.
A-12	(000007)	1	Response provided is inadequate: <i>The soil is 100%, 0 medium, 0 small, and the draining through soil is 21.</i> This is a restating of the data for soil A from the table. It does not describe or imply any understanding of size of particles and/or rate of water.

Anchor Set 3.....p.1

3

VC298869

Describe the relationship between the size of the soil particles and the rate at which water moves through the soil. Use the data in the table to support your answer.

If there are more larger particles, the water will drain more quickly. Soil A has 100% larger particles, so water moves through the soil more rapidly than Soil E, which has 100% smaller particles. Soil A's water moves at 21 cm/hr, and Soil E's water moves at 0.05 cm/hr.

3

VC298869

Describe the relationship between the size of the soil particles and the rate at which water moves through the soil. Use the data in the table to support your answer.

The larger the particles in the soil, the faster the water moves through. Soil A had 100% large particles and the water moved faster through Soil A.

3

VC298869

Describe the relationship between the size of the soil particles and the rate at which water moves through the soil. Use the data in the table to support your answer.

moves slower through little particles
(E) moves faster through big particles
(A)

Anchor Set 2Ap.2

2A

VC298869

Describe the relationship between the size of the soil particles and the rate at which water moves through the soil. Use the data in the table to support your answer.

The larger the particles the faster water moves
the smaller the particles the slower water moves.

2A

VC298869

Describe the relationship between the size of the soil particles and the rate at which water moves through the soil. Use the data in the table to support your answer.

The larger the soil particles, the faster water
moves through the soil

2A

VC298869

Describe the relationship between the size of the soil particles and the rate at which water moves through the soil. Use the data in the table to support your answer.

The smaller the particles sizes
in the soil are the slower water
will move through it.

Anchor Set 2B.....p.3

(2B)

VC298869

Describe the relationship between the size of the soil particles and the rate at which water moves through the soil. Use the data in the table to support your answer.

When at soil (A) 100% of the largest particles it moves through the water at a rate of 21 cm. per hour. At soil (E) 100% of the smallest particles it drains through the water at 0.65 cm. per hour.

(2B)

VC298869

Describe the relationship between the size of the soil particles and the rate at which water moves through the soil. Use the data in the table to support your answer.

In soil A the Rate of water more than soil E.

(1)

VC298869

Describe the relationship between the size of the soil particles and the rate at which water moves through the soil. Use the data in the table to support your answer.

The bigger the soil particle is, the slower it moves. The smaller it is, the quicker it moves.

Anchor Set 1.....p.4

1

VC298869

Describe the relationship between the size of the soil particles and the rate at which water moves through the soil. Use the data in the table to support your answer.

Depending on the size of the particles, the smaller amount of particles the faster rate, and the largest amount of particles the slower the rate.

1

VC298869

Describe the relationship between the size of the soil particles and the rate at which water moves through the soil. Use the data in the table to support your answer.

In	A	the	water	runs	21 cm/hr
In	B	It	runs	6.1 cm/hr	
In	C	It	runs	1.3 cm/hr	
In	D	The	water	runs	0.4 cm/hr
In	E	It	runs	0.05 cm/hr	

1

VC298869

Describe the relationship between the size of the soil particles and the rate at which water moves through the soil. Use the data in the table to support your answer.

The soil is 100% medium, small and the draining through soil is 21.

Practice Set 1 Score Guide.....p.1

	Code	Description
Complete	3	<p>Student response correctly describes the relationship between the size of soil particles and the rate at which water passes through soil using data from the table for support. Student response may or may not include quantitative information in the comparison.</p> <p>Note:</p> <ul style="list-style-type: none"> – Acceptable synonyms for “faster” include: highest, most, quicker. – Unacceptable synonyms for “faster” include: best. <p>For example:</p> <ul style="list-style-type: none"> • The larger the particles the faster the water travels through. For example, water passes through soil A, which has large particles at 21 cm/hr, while water only moves at 0.05 cm/hr through soil E, which has the smallest particles. • Water moves the slowest through soil E (0.05 cm/hr), which has very small particles and the fastest (21 cm/hr) through soil A, which has the largest particles. • That the bigger the particle the faster it travels because soil A at a 100 and the largest particle travels a 21 cm/hr where as soil D at 20 travels at 0.69 cm/hr. • Water moves fastest through soil with large particles (soil A) and slowest through soil with small particles (soil E). • The more small particles contained in the soil, the slower the water passes through it. Soil E has the most small particles and the slowest rate.

Practice Set 1 Score Guide Continued.....p.2

Partial	2A	<p>Student response correctly describes the relationship between particle size and rate of water movement, but does not refer to the data from the table for support.</p> <p>For example:</p> <ul style="list-style-type: none"> • The larger the particle the higher the rate of water moving through the soil. The smaller the particle is then the least rate of water moving will appear. • The more small particles contained in the soil, the slower the water runs through it. • The water runs through soil with the largest particles fastest.
	2B	<p>Student response provides a correct statement using data in the table that addresses the size/rate relationship, but does not establish the relationship between the size of soil particles and the rate at which water passes through soil. The response includes some kind of comparative language (explicit or implied) that indicates an understanding of the data.</p> <p>Note: Acceptable comparative language includes: fast(er), slow(er), big(ger), large(r), small(er), quick(er).</p> <p>For example:</p> <ul style="list-style-type: none"> • Water moves fastest through soil A and slowest through soil E. • The water runs through the soil with 100% large particles at 21 cm/hr and through the soil with 100% small particles at 0.05 cm/hr. • The size of the soil particles of soil A is faster because the rate of it is 21 cm/hr. • The soil A moves quicker through the water at 21 cm/hr. And the soil E moves slower at .05 cm/hr.
Unsatisfactory/Incorrect	1	<p>Student response is inadequate or incorrect. The response may repeat data from the table, but describes an incorrect relationship between particle size and rate.</p> <p>For example:</p> <ul style="list-style-type: none"> • The smaller the particles, the faster the water moves through them. • The relationship between the size of the soil particles and the rate at which water move through the soil is that both have a good rate. • The more particles you have in the soil the more rate of water is moving through the soil. • The more texture the soil has the faster the water moves through it.

Relative Size Practice Set 1

Practice Set 1 Responses....p.1

WFMID: Z3526900			Sequence 0000256507
NAEP 2009	Grade 08	Subject SC	PAS 002800085
UIN 00020803199805200902		Batch I0028900	Clip VC298869
		Import Item ID 09F2S11_06	

PI-1

Describe the relationship between the size of the soil particles and the rate at which water moves through the soil. Use the data in the table to support your answer.

The bigger the particles the easier the water can move through the particles.

WFMID: Z3526900			Sequence 0000256297
NAEP 2009	Grade 08	Subject SC	PAS 013400173
UIN 00020256279813200902		Batch I0134900	Clip VC298869
		Import Item ID 09F2S11_06	

PI-2

Describe the relationship between the size of the soil particles and the rate at which water moves through the soil. Use the data in the table to support your answer.

The water moves through the larger and medium-sized particles better than the smaller particles.

Relative Size Practice Set 1

Practice Set 1 Repsonses....p.2

WFMID: Z3526900	Sequence 0000256338	
NAEP 2009	Grade 08	Subject SC
UIN 00020346959815200902	Batch I0077900	PAS 007700203
	Import Item ID 09F2S11_06	Clip VC298869

PI-3

VC298869

Describe the relationship between the size of the soil particles and the rate at which water moves through the soil. Use the data in the table to support your answer.

the smaller the particles
the slower it drains.

100/0/0/2/
0/0/100/0.05

WFMID: Z3526900	Sequence 0000256441	
NAEP 2009	Grade 08	Subject SC
UIN 00020796659809200902	Batch I0011900	PAS 001100130
	Import Item ID 09F2S11_06	Clip VC298869

PI-4

VC298869

Describe the relationship between the size of the soil particles and the rate at which water moves through the soil. Use the data in the table to support your answer.

Soil A Because it is the
largest and the water
moves through it the
fastest

Practice Set 1 Responsesp.3

WFMID: Z3526900

NAEP 2009 Grade 08

Subject SC

Batch I0255900

Sequence 0000256369

PAS 025500304

UIN 00020369609815200902

Import Item ID 09F2S11_06

Clip VC298869

PI-5

VC298869

Describe the relationship between the size of the soil particles and the rate at which water moves through the soil. Use the data in the table to support your answer.

As you can see on the table, Soil A has the highest rate of water Draining through the soil. The larger the Particles the higher the rate of water draining.

WFMID: Z3526900

NAEP 2009 Grade 08

Subject SC

Batch I0134900

Sequence 0000256288

PAS 013400028

UIN 00020254829813200902

Import Item ID 09F2S11_06

Clip VC298869

PI-6

VC298869

Describe the relationship between the size of the soil particles and the rate at which water moves through the soil. Use the data in the table to support your answer.

The thicker the soil, the slower the water moves through the soil. The relationship between the size of the soil and the rate of water is that the thinner the soil, the faster the water moves.

Relative Size Practice Set 1

Practice Set 1 Responsesp.4

WFMID: Z3526900	Sequence 0000256418
NAEP 2009 Grade 08	PAS 035400353
Subject SC Batch I0354900	Clip VC298869
UIN 00020393079815200902	Import Item ID 09F2S11_06

PI-7

VC298869

Describe the relationship between the size of the soil particles and the rate at which water moves through the soil. Use the data in the table to support your answer.

Soil (A) ^{has} large soil particles allow water to flow more freely because it's not as dense as (E) which has small particles.

WFMID: Z3524900	Sequence 0000000028
NAEP 2009 Grade 08	PAS 000300153
Subject SC Batch I0003900	Clip VC298869
UIN 00020248259813200902	Import Item ID 09F2S11_06

PI-8

VC298869

Describe the relationship between the size of the soil particles and the rate at which water moves through the soil. Use the data in the table to support your answer.

The highest water moves through soil is 21 cm per hour and the lowest is 0.05 cm per hour.

Practice Set 1 Responsesp.5

NAEP 2009	Grade 08	Subject SC	Batch I0077900	PAS 007700511
UIN 00020350039815200902		Import Item ID 09F2S11_06	Clip VC298869	

PI-9

VC298869

Describe the relationship between the size of the soil particles and the rate at which water moves through the soil. Use the data in the table to support your answer.

The relationship is the larger the particles are that make up the soil, the slower the water is going to move through. For example, soil A had 100% large particles and the water passed through at 21 cm/hr. Compared to 100% small particles and water passing through at 0.05 cm/hr.

WFMID: Z3526900				Sequence 0000256327
NAEP 2009	Grade 08	Subject SC	Batch I0077900	PAS 007700055
UIN 00020345479815200902		Import Item ID 09F2S11_06	Clip VC298869	

PI-10

VC298869

Describe the relationship between the size of the soil particles and the rate at which water moves through the soil. Use the data in the table to support your answer.

Soil A has the largest particle percentage and largest rate and soil E has the lowest particle percentage and lowest rate.